LIVERMORE LAB REPORT

A weekly review of scientific and technological achievements from Lawrence Livermore National Laboratory, Aug. 26-30, 2013.

FOX NEWS

FEELING THE BURN

The preamplifiers of the National Ignition Facility are the first step in increasing the energy of laser beams as they make their way toward the target chamber.

Lawrence Livermore's National Ignition Facility (NIF) recently focused all 192 of its ultrapowerful laser beams on a tiny deuterium-tritium filled capsule. In the nanoseconds (millionths of a second) that followed, the capsule imploded and released a neutron yield of nearly 8,000 joules of neutron energy -- approximately three times NIF's previous neutron yield record for cryogenic implosions.

The primary mission of NIF is to provide experimental insight and data for the National Nuclear Security Administration's science-based stockpile stewardship program. The experiment attained conditions not observed since the days of underground nuclear weapons testing and represents an important milestone in the continuing demonstration that the stockpile can be kept safe, secure and reliable without a return to testing.

Early calculations show that fusion reactions in the hot plasma started to self-heat the burning core and enhanced the yield by nearly 50 percent, pushing close to the margins of alpha burn, where the fusion reactions dominate the process.

To read more, go to *Fox News*.

NBC NEWS

THE PROBE IN SYRIA WILL GO ON

U.N. chemical weapons experts visit apparent victims of a gas attack on Monday at a hospital in a southwestern Damascus suburb. Photo courtesy of Reuters.

Delays in reaching a site where the Syrian government allegedly unleashed chemical weapons against its citizens on Aug. 21 should not prevent chemical weapons investigators from determining whether the outlawed armaments were used.

The ability of the U.N. inspectors to secure samples at the hospitals eases concerns over potential chain-of-custody issues on samples previously gathered by the rebels, both from the living and the dead.

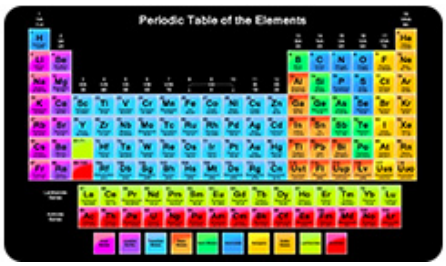
Armando Alcaraz, the principal investigator on chemical weapons at Lawrence Livermore, said either blood or environmental samples collected at the site could be valuable in determining whether nerve gas or other toxic agents were used.

"You can see some of adducts (molecules) in the plasma after a couple of months. It is persistent in the blood," Alcaraz said. "Environmental samples last longer depending on the environment. If maintained well, they would be there for a while, in both agents and degradation products that can point to what kind of nerve agents were used."

To read more, go to *NBC News*.

The New York Times

ELEMENTARY SCIENCE



At the bottom right corner of the periodic table of elements, there are a handful of boxes that illustrators often color gray. The boxes are for elements whose existence awaits confirmation from the International Union of Pure and Applied Chemistry(IUPAC).

But for element 115, which was first discovered by Lawrence Livermore and Russian scientists in 2006, that may soon change.

A new set of experiments backs up the discovery of 115 after an international team of physicists synthesized an element with 115 protons in the GSI accelerator in Germany.

When a new element is created, the IUPAC requires that another group of researchers not related to the first discovery confirm the results by replicating its own set of experiments. This is the first step to official recognition and eventual naming of element 115.

To read more, go to *The New York Times*.

spaceREF IT'S ONLY NATURAL

Cosmochemist Ian Hutcheon shows off a piece of the meteorite Allende, which contains some of the oldest objects in the solar system. A new mineral, hutcheonite, is named in honor of Hutcheon.

A mineral is naturally occurring substance that is solid and stable at room temperature. And Lawrence Livermore's Ian Hutcheon knows that first hand.

The newly discovered mineral, dubbed Hutcheonite, has been named after meteorite researcher Hutcheon. It can be seen only with high-powered scanning electron microscopes.

Hutcheonite was discovered in a refractory inclusion in the Allende meteorite by Sasha Krot (University of Hawaii) and Chi Ma (Caltech) and named in honor of Hutcheon, who has made numerous contributions to the study of meteorites and what they can tell us about the evolution of the early solar system.

To read more, go to *Space Ref*.

Medical Xpress

THE ANIMAL INSIDE OF YOU

LLNL scientist Monica Borucki and team members (from left) Jonathan Allen and Haiyin Chen are working toward a better understanding of animal-borne viruses.

Outbreaks such as the severe acute respiratory syndrome (SARS) Middle East respiratory syndrome coronavirus (MERS) have afflicted people around the world, yet many people think these trends are on the decline.

But the opposite is true.

The efforts to combat this epidemic are being spearheaded by a team of Lawrence Livermore scientists. Led by Monica Borucki, the Lab researchers have recently made promising new discoveries that provide insight into the emergence of inter-species transmittable viruses.

They discovered that the genetic diversity of a viral population within a host animal could allow a virus to adapt to certain conditions that could help it reach a human host. This discovery advances the scientific understanding of how new viruses produced from animal reservoirs can infect people. An animal reservoir is an animal species that harbors an infectious agent, which then goes on to potentially infect humans or other species.

To read more, go to *Medical Xpress*.
